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LAND RESOURCES: SOIL LOSS

Text submitted by the Chairman on the basis of negotiations held on document A/CONF.151/PC/100/Add.18

Managing fragile ecosystems: sustainable mountain development (Section II, Chapter 5 of Agenda 21)

Attached is the text of document A/CONF.151/PC/100/Add.18 as it has been agreed in negotiations on 12 March 1992. The paragraphs in the introduction, basis for action and means for implementation have not been negotiated: language on these points will be inserted later, based on the results of ongoing consideration of cross-sectoral issues.

INTRODUCTION

1. Mountains are an important source of water, energy and biological diversity. Furthermore they are a source of key resources such as water, minerals, forest products, agricultural products and recreation. As a major ecosystem representing the complex and interrelated ecology of our planet, mountain environments are essential to the survival of the global ecosystem. Mountain ecosystems are, however, rapidly changing. They are susceptible to accelerated soil erosion, landslides and rapid loss of habitat and genetic diversity. On the human side, there is widespread poverty among mountain inhabitants and loss of indigenous knowledge. As a result, most global mountain areas are experiencing environmental degradation. Hence, the proper management of mountain resources and socio-economic development of the people deserves immediate action.

2. About 10 per cent of the world's population depends on mountain resources. A much larger percentage draws on other mountain resources, including and especially water. Mountains are a storehouse of biological diversity and endangered species.

3. Recognizing the interplay of ecological and developmental factors, the Preparatory Committee for the UNCED at its third session requested the Secretary-General of the United Nations Conference on Environment and Development to further elaborate the problem of fragile ecosystems and develop separate programmes with regard to all the mountains of the world (A/CONF.151/PC/WG.I/L.34/Rev.1). In view of this decision two programme areas are proposed as follows:

A. Generating and strengthening knowledge about the ecology and sustainable development of mountain ecosystems

B. Promoting integrated watershed development and alternative livelihood opportunities

PROGRAMME AREAS

A. GENERATING AND STRENGTHENING KNOWLEDGE ABOUT THE ECOLOGY AND SUSTAINABLE DEVELOPMENT OF MOUNTAIN ECOSYSYTEMS

Basis for action

4. Mountains are highly vulnerable to human and natural ecological imbalance. Mountains are the most sensitive areas to all climatic changes in the atmosphere. Specific information on ecology, natural resource potential and socio-economic activities is essential. Mountain and hillside areas hold a rich variety of ecological systems. Because of their vertical dimensions, mountains create gradients of temperature, precipitation and insolation. A given mountain slope may include several climatic regimes such as tropics, subtropics, temperate and alpine, each of which represents microcosms of larger habitat diversity. There is, however, a lack of knowledge of mountain ecosystems. The creation, therefore, of a global mountain database is vital for launching programmes that would contribute to sustainable development of mountain ecosystems.

Objectives

5. Undertake a survey of the different forms of soils, forest, water use, crop, plant and animal resources of mountain ecosystems, taking into account the work of existing international and regional organizations.

6. Maintain and generate database and information systems to facilitate the integrated management and environmental assessment of mountain ecosystems, taking into account the work of existing international and regional organization.

7. Improve and build the existing land/water ecological knowledge base regarding technologies and agricultural and conservation practices in the mountain regions of the world with the participation of local communities.

8. Create and strengthen the communications network and information clearing-house for existing organizations concerned with mountain issues.

9. Improve coordination of regional efforts to protect fragile mountain ecosystems through the consideration of appropriate mechanisms, including regional legal and other instruments.

10. Generate information to establish database and information systems to facilitate an evaluation of environmental risks and of natural disaster in mountain ecosystems.

Activities

Management-related:

11. National Governments with the supports of the relevant international organizations should:

(a) Strengthen existing institutions or establish new ones at local, national and regional levels to generate a multidisciplinary land/water ecological knowledge base on mountain ecosystems;

(b) Promote national policies that would provide incentives to local people for the use and transfer of environment-friendly technologies as well as farming and conservation practices;

(c) Build up the knowledge base and understanding by creating mechanisms for cooperation and information exchange among national and regional institutions working on fragile ecosystems;

(d) Encourage policies that would provide incentives to farmers and local people to undertake conservation and regenerative measures;

(e) Diversify mountain economies including creating and/or strengthening of tourism in accordance with integrated management of mountain areas;

(f) Integrate all forest, rangelands and wildlife activities in such a way that specific mountain ecosystems are maintained;

(g) Establish appropriate natural reserves in representative species-rich sites and areas.

Data and information:

12. National Governments with the support of relevant international organizations should:

(a) Maintain and establish meteorological, hydrological and physical monitoring analysis and capabilities that would encompass the climatic diversity as well as water distribution of various mountain regions of the world;

(b) Build an inventory of different forms of soils, forest, water use and crop, plant and animal genetic resources, giving priority to those under threat of extinction. Genetic resources should be protected in situ by maintaining and establishing protected areas and improving traditional farming and animal husbandry activities and establishing programmes for evaluating the potential value of the resources;

(c) Identify hazardous areas that are most vulnerable to erosion, floods, landslides, earthquakes, snow avalanches and other natural hazards;

(d) Identify mountain areas threatened by air pollution from neighbouring industrial and urban areas.

International and regional cooperation:

13. National Governments and intergovernmental organizations should:

(a) Coordinate regional and international cooperation and facilitate an exchange of information and experience among the specialized agencies, the World Bank, the International Fund for Agricultural Development (IFAD) and other international and regional organizations, national Governments, research institutions and non-governmental organizations working on mountain development;

(b) Encourage regional, national and international networking of people's initiatives and the activities of international, regional and local non-governmental organizations working on mountain development, such as the United Nations University (UNU), the Woodland Mountain Institutes (WMI), the International Center for Integrated Mountain Development (ICIMOD), the International Mountain Society (IMS), the African Mountain Association and the Andean Mountain Association, besides supporting those organizations in exchange of information and experience;

(c) Protect Fragile Mountain Ecosystem through the consideration of appropriate mechanisms including regional legal and other instruments.

Means of implementation

Financing and cost evaluation:

14. The total cost required to implement this programme area is about US$ 330 million a year, while the average annual financing required from international sources is about US$ 50 million. This includes US$ 40 million for technical cooperation and US$ 10 million for the strengthening of international institutions, particularly the United Nations Educational, Scientific and Cultural Organization, the United Nations University, the World Conservation Union (IUCN), the International Mountain Society (IMS), the Woodland Mountain Institutes (WMI) and the International Center for Integrated Mountain Development (ICIMOD), as well as the African Mountain Association and the Andean Mountain Association.

Scientific and technological means:

15. National Governments with the appropriate international and regional agencies should **(A/CONF.151/PC/WG.I/CRP.12/Rev.1, para. 14j)‹ strengthen scientific research and technological development programmes including diffusion through national and regional institutions in this field** (particularly in meteorology, hydrology, forestry, soil sciences and plant sciences).

Human resource development:

16. National Governments should:

(a) Launch training and extension programmes in environmentally appropriate technologies and practices that would be suitable to mountain ecosystems;

(b) Support higher education through fellowships and research grants for environmental studies in mountains and hill areas, particularly for candidates from indigenous mountain populations.

Capacity-building:

17. National Governments should **(A/CONF.151/PC/WG.I/CRP.12/Rev.1, para. 14e)‹ build up national and regional institutional bases that could carry research, training and dissemination of information on the sustainable development of the economies of fragile ecosystems.›**

B. PROMOTING INTEGRATED WATERSHED DEVELOPMENT AND ALTERNATIVE LIVELIHOOD OPPORTUNITIES

Basis for action

18. Nearly half of the world's population is affected in various ways by mountain ecology and the degradation of watershed areas. About 10 per cent of the Earth's population lives in mountain areas with higher slopes while about 40 per cent occupies the adjacent medium- and lower-watershed areas. There are serious problems of ecological deterioration in these watershed areas. For example, in the hillside areas of the Andean countries of South America a large portion of the farming population is now faced with a rapid deterioration of land resources. Similarly, the mountain and upland areas of the Himalayas, South-East Asia and East and Central Africa, which make vital contributions to agricultural production, are threatened by cultivation of marginal lands due to expanding population. In many areas this is accompanied by excessive livestock grazing, deforestation and loss of biomass cover.

19. Soil erosion can have a devastating impact on the vast numbers of rural people who depend on rainfed agriculture in the mountain and hillside areas. Poverty, including unemployment, poor health and bad sanitation, are widespread. Promoting integrated watershed development programmes through effective participation of local people is a key to preventing further ecological imbalance. An integrated approach is needed for conserving, upgrading and using the natural resource base of land, water, plant, animal and human resources. In addition, promoting alternative livelihood opportunities, particularly through development of employment schemes that increase the productive base, will have a significant role in improving the standard of living among the large rural population living in mountain ecosystems.

Objectives

20. By the year 2000, develop appropriate land use planning and management for both arable and non-arable land in mountain-fed watershed areas to prevent soil erosion, increase biomass production and maintain the ecological balance.

21. Promote income-generating activities such as sustainable tourism, fisheries and environmentally sound mining and improvement in infrastructure and social services, in particular to protect the livelihoods of local communities and indigenous people.

22. Develop technical and institutional arrangements for affected countries to mitigate the effects of natural disasters through hazard-prevention measures, risk zoning, early-warning systems, evacuation plans and emergency supplies.

Activities

Management-related:

23. National Governments with support of the relevant international organizations should:

(a) Undertake measures to prevent soil erosion and promote erosion-control activities in all sectors;

(b) Establish task forces or watershed development committees, complementing existing institutions, to coordinate integrated services to support local initiatives in animal husbandry, forestry, horticulture and rural development at all administrative levels;

(c) Enhance popular participation in the management of local resources through appropriate legislation;

(d) Support non-governmental organizations and other private groups assisting local organizations and communities in the preparation of projects that would enhance participatory development of local people;

(e) Provide mechanisms to preserve threatened areas that could protect wildlife, conserve biological diversity or serve as national parks;

(f) Develop national policies that would provide incentives to farmers and local people to undertake conservation measures as well as to use environment-friendly technologies;

(g) Undertake income-generating activities in cottage and agro-processing industries, such as the cultivation and processing of medicinal and aromatic plants;

(h) Undertake the above activities, taking into account the need for full participation of women, including indigenous people and local communities, in development.

Data and information:

24. National Governments should:

(a) Establish monitoring and evaluation capacities at the national, State or provincial level to generate information for daily operations as well as to assess the environmental and socio-economic impacts of projects;

(b) Generate data on alternative livelihoods and diversified production systems at the village level on annual and tree crops, livestock, poultry, beekeeping, fisheries, village industries, markets, transport and income-earning opportunities, taking fully into account the role of women and integrating them into the planning and implementation process.

International and regional cooperation:

25. National Governments, international agencies and regional organizations should:

(a) Strengthen the role of appropriate international research and training institutes of the Consultative Group on International Agricultural Research Centers (CGIAR) and the International Board for Soil Research and Management (IBSRAM) as well as regional research centres such as the Woodland Mountain Institutes and the International Center for Integrated Mountain Development in undertaking applied research relevant to watershed development;

(b) Promote regional cooperation and exchange of data and information among countries sharing the same mountain ranges and river basins, particularly those affected by mountain disasters and floods;

(c) Establish partnerships with non-governmental organizations and other private groups working in watershed development.

Means of implementation

Financial and cost evaluation:

26. Total funding required to implement this programme area is about US$ 13 billion a year, mostly from national local and private sources. Of the US$ 13 billion about US$ 1.9 billion would be needed from international sources. About US$ 1.7 billion would be related to development and about US$ 1.7 billion could be ascribed to global environmental issues. About US$ 30 million is needed for strengthening the capacity of international institutions, in particular those involved in watershed development such as the United Nations Development Programme, the Food and Agriculture Organization of the United Nations and the World Bank.

27. Financing for the promotion of alternative livelihoods in mountain ecosystems should be viewed as part of a country's anti-poverty or alternative livelihoods programme, which is also discussed in the chapters on Combating Poverty and Meeting Basic Needs and Promoting Sustainable Agriculture and Rural Development.

Scientific and technical means:

28. National Governments and local communities with the cooperation of the appropriate specialized agencies, as well as international and national research centres should:

(a) **(A/CONF.151/PC/WG.I/CRP.12/Rev.1, para. 14g)‹ Consider undertaking pilot projects that combine environmental protection and development functions with particular emphasis on some of the traditional environmental management practices/systems that have good environmental impact;›**

(b) Generate technologies for specific watershed and farm conditions through a participatory approach involving local men and women, researchers and extension agents who will carry out experiments and trials on farm conditions;

(c) Promote technologies of vegetative conservation measures for erosion prevention, in situ moisture management, improved cropping technology, fodder production and agroforestry that are low-cost, simple and easily adopted by local people.

Human resource development:

29. National Governments and local communities should:

(a) Promote a multidisciplinary and cross-sectoral approach in training and dissemination of knowledge to local people on wide-ranging issues such as household production systems, conservation and utilization of arable and non-arable land, treatment of drainage lines and recharging of groundwater, livestock management, fisheries, agroforestry and horticulture;

(b) **(A/CONF.151/PC/WG.I/CRP.12/Rev.1, para. 14f) ‹Develop human resources by providing access to education, health, energy and infrastructure;›**

(c) Promote local awareness and preparedness for disaster prevention and mitigation combined with the latest available technology for early warning and forecasting.

Capacity-building:

30. National Governments with the support of the international community should develop and strengthen national centres for watershed management to encourage a comprehensive approach to the environmental, socio-economic, technological, legislative, financial and administrative aspects and provide support to policy makers, administrators, field staff and farmers for watershed development.

31. The private sector and local communities in cooperation with national Governments should promote local infrastructure development, including communication networks, mini- or micro-hydro development to support cottage industries, and access to markets.